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Abstract

THE PHYSICAL CONCENTRATION OF LOW-GRADE ARGILLOCALCAREOUS URANIUM ORES IN ARGENTINA

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The "Don Rodolfo" (Cosquín, Province of Córdoba) uranium ore deposit is characterized by large reserves of low content, thus necessitating preliminary concentration by physical methods to achieve economic recovery of the uranium they contain.

In this deposit the metal is present as carnotite and tyuyamunite, contained in argillocalcareous gangue, with contents ranging between 0.014% and 0.10% U_3O_3.

Concentration assays were carried out as described below:

(a) crushing the unsorted ore into particles of 33 mm. diameter;

(b) malaxation of the ore in water;

(c) sifting through a Tyler 20-mesh screen;

(d) milling the oversize from +20 mesh to -20 mesh;

(e) desliming the pulp by siphoning;

(f) treatment of the suspension by hydraulic cyclone separator in one or more stages to obtain concentrate and middlings, followed in some cases by processing of the fraction on shaking tables, in accordance with various operational techniques.

The results obtained show that concentrates with a uranium content 3-4 times higher than that of the unsorted ore can be achieved, as well as recoveries of close to 70%.

A supplementary operation consisting in processing with a shaking table leads to higher recovery of the uranium contained in the middlings.

From a study of the results of enriching the ore by these gravitational processes based on the use of hydraulic cyclone separators in conjunction with shaking tables, it is concluded that the higher the uranium content of the ore processed, the higher will be the content and recovery of the concentrate obtained. Since calcium carbonate enrichment of the concentrates occurs simultaneously with that of uranium, acid leaching is excluded as a method for the subsequent processing of the products obtained.